

**UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

POWER2B, INC., <i>Plaintiff,</i> v. SAMSUNG ELECTRONICS CO., LTD. and SAMSUNG ELECTRONICS AMERICA, INC., <i>Defendants.</i>	Case No. 6:20-cv-01183-ADA
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**DECLARATION OF DR. D. RICHARD BROWN III
IN SUPPORT OF PLAINTIFF POWER2B INC.'S
RESPONSIVE CLAIM CONSTRUCTION BRIEF**

1. My name is D. Richard Brown III. Plaintiff Power2B, Inc. ("Power2B") has retained me in connection with the above captioned litigation. My compensation is not dependent on the outcome of this litigation. I respectfully submit this declaration in further support of Power2B's Responsive Claim Construction Brief. I have personal knowledge of the matters set forth herein and could competently testify to these matters if called as a witness.

2. I have been asked to provide my opinion about how a person of ordinary skill in the art at the time of invention of U.S. Patent Nos. 8,610,675 ("the '675 Patent"), 8,624,850 ("the '850 Patent"), 9,317,170 ("the '170 Patent"), 9,569,093 ("the '093 Patent") and 10,156,931 ("the '931 Patent") (collectively the "Asserted Patents"), would understand the meaning of certain terms appearing in claims of the Asserted Patents, as well as whether certain terms identified by Defendants Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively "Samsung") inform, with reasonable certainty, those skilled in the art about the scope of the invention.

3. In response I have provided my opinions and the bases thereof in the following sections of this Declaration.

I. BACKGROUND AND QUALIFICATIONS

4. A current copy of my curriculum vitae setting forth details of my background and relevant experience is attached hereto as Exhibit A.

5. I received my Bachelor's and Master's degrees in Electrical Engineering from the University of Connecticut in 1992 and 1996, respectively. I received my Ph.D. degree in Electrical Engineering from Cornell University in 2000. I am currently a Professor and the Head of the Department of Electrical and Computer Engineering at Worcester Polytechnic Institute in Worcester, Massachusetts. In this position, I am responsible for conducting novel research, teaching undergraduate and graduate courses, and for certain administrative tasks.

6. I was a development engineer at General Electric from May 1992 to December 1996. During this period, I worked on several projects including circuit design, embedded systems design, software and firmware development, communication system design, sensor systems and networks, user interface design, and product commercialization. In 1997, I left General Electric to pursue my Ph.D. degree at Cornell University which I completed in May 2000. Since August 2000, I have been a faculty member at Worcester Polytechnic Institute.

7. During my academic career, I have taught undergraduate-level and graduate-level courses and advised dozens of student projects in the areas of signal processing, sensor systems, microprocessor system design, software and firmware development, communication systems, digital communications, wired and wireless networking, and signal detection and estimation. I have authored or co-authored more than 110 original articles in the fields of communication systems, networking, signal processing, synchronization, and information theory, including

several highly cited articles on signal processing and distributed wireless communication systems. I have also authored or co-authored four book chapters on subjects related to signal processing, synchronization, and low-latency networking. I have received significant funding from the National Science Foundation (NSF), the Defense Advanced Research Projects Agency (DARPA), and Bose, Inc. in support of my research. I was elected a Senior Member of the Institute for Electrical and Electronics Engineers (IEEE) in 2009 for contributions to signal processing and communication systems.

8. Among my various research subjects, I have advised projects and authored original papers on novel sensor systems and target tracking algorithms. One example is my work on novel a novel speech sensor for high noise environments which was reported in a 2005 journal article entitled “Measuring glottal activity during voiced speech using a tuned electromagnetic resonating collar sensor.” Another example is my work on a novel tracking algorithm in a 2012 conference paper entitled “Receiver-Coordinated Distributed Transmit Beamforming with Kinematic Tracking.” Other examples of my peer-reviewed papers on the subjects of signal processing, sensor systems, and target tracking can be found in my Curriculum Vitae, attached as Exhibit A.

9. I have worked as a consultant on a variety of projects since receiving my Ph.D. These projects have included the development of sensor systems and signal processing techniques for a wide range of applications including precise synchronization and localization of mobile devices through novel sensor fusion techniques. I have also served as an expert witness on several occasions and have performed extensive code reviews in patent litigation cases.

10. I have served on several government expert panels for the National Science Foundation. From 2016-2018, I also served the National Science Foundation as a Program Director. I was responsible for managing a \$20 million annual award budget and a diverse

portfolio of projects addressing cutting-edge problems in signal processing, information theory, wireless communications, and networking.

11. I am a co-inventor on three issued patents, U.S. Patents Nos. 5,867,669, 5,862,391, and 8,634,405, and on two additional U.S. Patent Applications.

12. In summary, I have almost 30 years of experience as an Electrical Engineer with a broad background in sensor systems, signal processing, embedded systems design, software and firmware development, and wireless communication systems.

II. MATERIALS CONSIDERED

13. I have considered the Asserted Patents, the prosecution histories of the Asserted Patents, Samsung's Opening Claim Construction Brief and accompanying Exhibits, the Expert Declaration of Majid Sarrafzadeh filed with Samsung's Opening Claim Construction Brief and accompanying Exhibit, the parties' proposed constructions, and the parties' disclosure and production of extrinsic evidence. I have also relied on my professional and academic experience in the field of electrical and computer engineering. I reserve the right to consider additional materials as I become aware of them and to revise my opinions accordingly.

III. PERSON OF ORDINARY SKILL IN THE ART

14. In my opinion, with respect to the Asserted Patents, a person of ordinary skill in the art ("POSITA") would have had a bachelor's degree in electrical engineering, computer engineering, or a related field, and at least three years of experience relating to research, design, and/or development of sensor systems, circuits, and signal processing algorithms, or the equivalent, with education substituting for experience and vice versa.

15. I further note that I consider myself to have this minimum level of skill in the art and beyond. Thus, I am well qualified to give technical opinions from the perspective of a POSITA.

IV. LEGAL STANDARDS

16. I understand that claim construction is a matter of law and that at the writing of this Declaration the Court has not provided an opinion on claim construction.

17. I understand that a claim construction inquiry begins and ends in all cases with the actual words of the claim. Thus, quite apart from the written description and the prosecution history, the claims themselves provide substantial guidance as to the meaning of particular terms. I further understand that to begin with, the context in which a term is used in the asserted claim can be highly instructive. The patent specification can also shed light on the meaning of claim terms as well as the prosecution history. It is also my understanding that, when considering claim terms, it may be proper to consider evidence external to the patent and prosecution history, including, for example, dictionaries and related industry standards.

18. I understand that when conducting a claim construction inquiry, district courts are not (and should not be) required to construe every limitation present in a patent's asserted claims. Simply put, claim construction is not an obligatory exercise in redundancy. I further understand that where a term is used in accordance with its plain meaning, the court should not re-characterize it using different language.

19. I understand that there is a "heavy presumption" that claim terms carry their full ordinary and customary meaning, unless the accused infringer can show the patentee expressly relinquished claim scope. The ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the

invention. Thus, the task of comprehending the claims often involves little more than the application of the widely accepted meaning of commonly understood words.

20. I understand that without clear and unambiguous disclaimer, courts do not import limitations into claims from examples or embodiments appearing only in a patent's written description, even when a specification describes very specific embodiments of the invention or even only a single embodiment. Similarly, statements during patent prosecution do not limit the claims unless the statement is a clear and unambiguous disavowal of claim scope.

21. I understand that U.S. patents are presumed to be valid and a party challenging the validity of a patent has the burden of proving invalidity by clear and convincing evidence.

22. I understand that a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.

23. I further understand that the definiteness requirement must take into account the inherent limitations of language. Some modicum of uncertainty is the price of ensuring the appropriate incentives for innovation.

V. THE ASSERTED PATENTS

24. The Asserted Patents generally relate to input systems for sensing or detecting positions and/or movements of a user's finger, hand, or other object (such as a stylus), relative to a surface on a device. Sensors or detectors are used to sense or detect a position and/or movement of the finger, hand, or other object using projected or reflected electromagnetic radiation. The finger, hand, or other object may be positioned some distance away from the surface of the device and not in contact with the device. Detected positions and/or movements may be used to control device operations, such as navigation. The technology is thus able to provide gesture-sensing or

object-sensing functionality that translates user gestures or movements into device input, without requiring physical contact with the device.

25. More particularly, the Asserted Patents are generally related to user interface functionality in that they describe various configurations of electronic hardware and circuits to sense the position/motion of fingers or other nearby objects and use these sensed positions/motions for input or control of an electronic device. Rather than the conventional approach of having the user touch the buttons or screen on the device, the Asserted Patents describe inventions where input or control of the device can be achieved without requiring contact between the user and the device. The '675 Patent and '170 Patent specifications describe a system with position/motion sensing such that a “gesture can replace multiple touch engagements required by prior art devices.” '675 Patent at 69:25-27; *see also* '170 Patent at 69:25-27. The '850 Patent and '093 Patent specifications describe a system with position/motion sensing designed to “substantially enhance conventional touch screen functionality by adding another input dimension.” '850 Patent at 7:10-12; *see also* '093 Patent at 7:24-26. The '931 Patent specification describes a system with position/motion sensing where a “three-dimensional position of the object and angular orientation of the object” are used to provide improved user interface functionality. '931 Patent at 4:63-65. How each patent goes about addressing this general class of problems is different, however, as discussed below.

A. Dr. Sarrafzadeh Fundamentally Mischaracterizes the Claims of the Asserted Patents

26. In his Declaration, Dr. Sarrafzadeh mischaracterizes claim 1 of the '675 Patent by saying “[a]s described in claim 1, the combined device is straightforward. It includes a display made up of a number of pixels.” Sarrafzadeh Decl. at ¶29. In fact, claim 1 does not recite a “display” at all. Among other things, claim 1 recites “an interactive surface element” and a “pixel

array comprising a plurality of detector elements configured to detect electromagnetic radiation.” Dr. Sarrafzadeh ignores the context for the phrase “pixel array” and erroneously equates “pixel array” with “display.” The claim language clearly provides sufficient context for a POSITA to understand that the “pixel array” described here is *not an output device* emitting light or electromagnetic radiation, *i.e.*, the “pixel array” in this claim is not a display. Rather it is *an input device* comprising a plurality of detector elements configured to sense or detect electromagnetic radiation. A POSITA would understand the “pixel array” described in this claim to be similar in principle to the image sensor in a digital camera which contains a plurality of sensor elements (pixels) configured to sense visible light. Dr. Sarrafzadeh’s fundamental misunderstanding of the term “pixel array” in claim 1 of the ’675 Patent has led him to improperly characterize this claim term as requiring a display.

27. Dr. Sarrafzadeh further mischaracterizes the claims of each of the Asserted Patents as being “directed to [elements in] touchscreen devices.” Sarrafzadeh Decl. at ¶¶ 28, 32, 43 & 49. The intrinsic evidence provides no support for this characterization. The terms “touchscreen” or “touch screen” appear nowhere in any of the claims of the Asserted Patents. The terms “touchscreen” or “touch screen” also appear nowhere in the specifications of the ’675 Patent, the ’170 Patent, or the ’931 Patent. The term “touch screen” only appears in the specification of the ’850 Patent and the ’093 Patent as: “It is appreciated that the various embodiments of the present invention described hereinabove substantially enhance conventional touch screen functionality by adding another input dimension.” ’850 Patent at 7:9-12. Nevertheless, as stated above, none of the asserted claims of the ’850 or ’093 Patents affirmatively recite a “touchscreen” or “touch screen” and as such, broadly characterizing the Asserted Patents and asserted claims as being directed to elements of a touchscreen device is improper.

B. The '675 Patent

28. The '675 Patent “seeks to provide improved assemblies including improved user interfaces and user interface functionalities, particularly useful for displays, such as those employed with computers, televisions, personal communicators and other mobile devices.” '675 Patent at 1:63-67. The asserted claims (at least claims 1, 11, and 13) recite a “position sensing assembly” with an interactive surface element and an array of electromagnetic radiation sensors called a “pixel array” coupled to a circuit to sense the position of and enable user input from one or more nearby objects such as fingers or a stylus. Unlike conventional buttons or touch screen sensors, the nearby object is not required to be in contact with the assembly for the position sensing and user input to occur. Rather, the '675 Patent describes a system with novel position sensing such that a “gesture can replace multiple touch engagements required by prior art devices.” '675 Patent at 69:25-27.

C. The '170 Patent

29. The '170 Patent is a continuation of the '675 Patent and the specifications of the '170 Patent and '675 Patent are nearly identical. The asserted claims (at least claims 1, 2, 13, 14, 18, 21, and 26) recite, among other things, an “interactive assembly” with an interactive surface element having first and second regions with different functionality, electromagnetic radiation sensors, and circuitry configured to sense the position of and enable user input from one or more nearby objects such as fingers or a stylus. Unlike conventional buttons or touch screen sensors, the nearby object is not required to be in contact with the assembly for the position sensing and user input to occur.

D. The '850 Patent

30. The '850 Patent “seeks to provide an integrated display and input device, improved user interfaces and user interface functionalities, particularly useful for displays, such as those

employed with computers, televisions, personal communicators and other mobile device.” ’850 Patent at 1:51-55. The asserted claims (at least claims 15, 17, 18, 21, 26, 30, 31, and 41) recite, among other things, an “integrated display and input device” with a “pixel array” now serving as a “visibly sensible output,” one or more position sensors, and circuitry configured to convert the position sensor outputs to signals representative of the position of one or more objects such as fingers or a stylus. It is worth pointing out here that the phrase “pixel array” in the asserted claims of the ’850 Patent has a different context than the phrase “pixel array” in the claims of the ’675 Patent and ’170 Patent. I will explain this difference in more detail later in this Declaration. Nevertheless, similar to the aforementioned patents, the nearby object is not required to be in contact with the device for the position sensing and user input to occur.

E. The ’093 Patent

31. The ’093 Patent is a continuation of the ’850 Patent and the specifications of the ’850 Patent and ’093 Patent are nearly identical. The asserted claims (at least claims 1, 5, 8, 11, 12, 13, 26, 29, 36, 37, 38, 44, 45, 48, 49, 56, 57, and 58) recite, among other things, an “integrated display and input device” with a “pixel array” now serving as a “visibly sensible output”, one or more position sensors, an illuminator to illuminate an object, and circuitry configured to convert the position sensor outputs to signals representative of the position of objects such as fingers or a stylus. The nearby object is not required to be in contact with the device for the position sensing and user input to occur.

F. The ’931 Patent

32. The ’931 Patent “describes an integrated display and input device.” ’931 Patent at 1:37-38. The asserted claims (at least claims 1, 2, 7, 10, 13, 14, and 21) recite, among other things, a device, method, and system comprising a display panel having a pixel array “configured to visually present digital content,” an infrared emitter illuminating one or more nearby objects, e.g.,

fingers, a position sensing array sensing light reflected by one or more objects, and a processing unit to convert the outputs from the position sensing array to positions of the objects as well as execute input functionality. Consistent with the other Asserted Patents, the nearby object is not required to be in contact with the device for the position sensing and user input to occur.

VI. AGREED TERMS

33. I understand that Power2B and Samsung have agreed to the construction below.

Claim Term	Agreed Construction
“position sensing array” (’931 Patent, claims 1, 13)	“arrangement of two or more position sensors”

VII. DISPUTED TERMS FOR THE ASSERTED PATENTS

A. “radiation at [a]/[the]/[said] baseline level”

Claim Term	Power2B’s Construction	Samsung’s Construction
“radiation at [a]/[the]/[said] baseline level” (’675 Patent, claims 1, 11, 13; ’170 Patent, claims 1, 26; ’850 Patent, claims 21, 26, 31; ’093 Patent, claims 44, 56)	Plain and ordinary meaning	“level of light in the absence of a nearby object”

34. Power2B contends that this claim term requires no construction beyond its plain and ordinary meaning and I agree. One skilled in the art would not ascribe a special meaning to this term. A POSITA would understand every word of this term and understand that no further construction is required. The phrase consists of words that have a clear meaning to a POSITA. For example, a POSITA would understand that “baseline level” means an initial or control level. The specification uses these words in accordance with their plain and ordinary meaning.

35. Samsung contends that the term should be construed as “level of light in the absence of a nearby object.” As an initial matter, Samsung’s proposed construction would not fit the claim language. For example, substituting Samsung’s construction into claim 1 of the ’675 Patent would

result in claim 1 reciting: “at least one pixel array comprising a plurality of detector elements configured to detect electromagnetic ~~radiation at a baseline level~~ level of light in the absence of a nearby object.” Samsung’s construction would muddle the claim, as “electromagnetic level of light” is a nonsense combination of words. A Google search of this exact phrase yields zero results.

36. Samsung’s proposed construction is also at odds with the intrinsic evidence in the specifications of the Asserted Patents in that it improperly attempts to narrow the scope of the asserted claims by substituting “light” for the broader claim term “radiation.” The Asserted Patents disclose many specific examples of radiation including “IR radiation emitted from a human body or other heat source.” *See e.g.*, ’675 Patent at 15:23-24.

37. Moreover, Samsung’s construction injects ambiguity into the claim because a POSITA would not know when an object would be considered “nearby” or when it would not. It would also be unclear to a POSITA whether their proposed phrase “a nearby object” is a different “object” than the “at least one object” recited in the claim. For these reasons, I disagree with Samsung’s proposed construction.

38. I also disagree with the opinion of Dr. Sarrafzadeh that an initial level of radiation could be any arbitrary level of radiation taken at some unspecified time in the past. The relevant claims are apparatus claims, not method claims, and as such do not require performance of certain processes or steps in a particular order. In addition, Dr. Sarrafzadeh fails to give any consideration to the plain and ordinary meaning of the term “baseline” in the context of the rest of the claim or the intrinsic evidence. In context, claim 1 of the ’675 Patent recites: “wherein the change in the amount of radiation detected results from ones of the plurality of detector elements detecting reflected light from the object in addition to detecting the radiation at the baseline level.” A POSITA would understand that the recited “baseline” necessarily denotes some initial or control

level of radiation that is used to detect the recited “change in the amount of radiation detected.” The extrinsic evidence also supports the plain and ordinary meaning of “baseline.” The Merriam-Webster Dictionary (2004) provides a definition for baseline as “a line serving as a basis esp. to calculate or locate something.” Ex. B at 3.

B. The “propinquity” terms

Claim Term	Power2B’s Construction	Samsung’s Construction
“when the [at least one] object has at least a predetermined degree of propinquity to” (’675 Patent, claims 1, 13; ’850 Patent, claims 15, 31; ’093 Patent, claims 1, 44)	<i>propinquity</i> means “proximity,” and plain and ordinary meaning for the remaining language	“when the [at least one] object is within a predetermined proximity to and when the object is touching”
“configured to illuminate at least one object having at least a predetermined degree of propinquity to” (’170 Patent, claim 2)	<i>propinquity</i> means “proximity,” and plain and ordinary meaning for the remaining language	“configured to illuminate the at least one object when the object is within a predetermined proximity to and when the object is touching”
“propinquity” (’675 Patent, claims 1, 13; ’850 Patent, claims 15, 31; ’170 Patent, claims 1, 2; ’093 Patent, claims 1, 44)	“proximity”	This term must be understood in the context of the larger phrases above. See proposed constructions above.

39. It is my opinion that Power2B’s construction is the only one to accurately capture the plain meaning of “propinquity” as understood by a POSITA, in the context of the ’675 Patent, ’850 Patent, ’170 Patent, and the ’093 Patent. A POSITA would understand that “propinquity” means proximity, or in other words, near but not necessarily requiring touching. For example, the Merriam-Webster Dictionary (2004) provides that “propinquity” means “nearness in place or time: proximity.” Ex. 12 at P2BGES-0007823. Power2B’s proposed construction that “propinquity” means “proximity” is consistent with this definition.

40. Power2B’s construction is also supported by the intrinsic evidence. For example, the ’675 Patent repeatedly uses “propinquity” to describe and depict an object located some

distance from and not touching the device. *See e.g.*, '675 Patent at 62:11-13 (“In FIG. 20A, the user’s fingers are located in propinquity to interactive surface element 1508, at a height H therefrom”); 62:48-50 (“In FIG. 21A, the user’s fingers are located in propinquity to interactive surface element 1508, at respective heights H1 and H2 therefrom”); 64:48-53 (“FIG. 23B shows finger 1606 located at a first distance D1 from the second region of the interactive surface element 1601 overlying keyboard 1604, such that the propinquity responsive input functionality senses finger 1606 in propinquity to keyboard 1604”); 66:39-42 (“FIG. 24B shows finger 1710 located at a second location in the second region of the interactive surface element 1704 overlying slider 1708, such that the propinquity responsive input functionality senses the location of finger 1710 in propinquity to slider 1708”); 67:65-68:2 (“FIG. 25B shows finger 1806 located at a second location in the second region of the interactive surface element 1802 overlying slider 1805, such that the propinquity responsive input functionality senses the location of finger 1806 in propinquity to slider 1805”); 69:6-12 (“In the arrangement shown in FIG. 26A, the functionality of the second region governs the ringing volume of the communicator 1900 and the position of the hand 1906 shown in FIG. 26A and its degree of propinquity to the keyboard zone 1904 causes a reduction in the ringing volume.”); *see also* FIGS. 20A; 21A; 23B; 24B; 25B & 26A.

41. Where the '675 Patent intended to specifically describe “touch,” it used the word “touch.” For example, throughout the specification “touch” is used to describe an object in contact with the device. *See e.g.*, '675 Patent at 62:13-14 (“[I]n FIG. 20B, the user’s fingers touch interactive surface element 1508”); 62:51-52 (“[I]n FIG. 21B, the user’s fingers touch interactive surface element 1508.”); 65:24-29 (“In accordance with a preferred embodiment of the present invention, as shown in FIG. 23E, when the finger 1606 touches the second region of the interactive

surface element 1601 overlying button 1611 of keyboard 1604, a third function is actuated, such as the appearance of a number on display screen 1602, as indicated by reference numeral 1616.”); *see also* FIGS. 20B; 21B & 23E.

42. And when the specification describes both, propinquity and touch, it uses “propinquity” in describing an object in proximity to the device and “touch” in describing an object in contact with the device. *See e.g.*, ’675 Patent at 63:18-22 (“As seen in FIG. 22, the user’s fingers are located at a distance from one another. One of the user’s fingers is located in propinquity to interactive surface element 1508, at a height H therefrom, and one of the user’s fingers touches interactive surface element 1508.”); FIG. 22.

43. The specification of the ’675 Patent also uses the terms “propinquity” and “proximity” interchangeably. *See e.g.*, ’675 Patent at 50:17-27 (“Additionally, the three-dimensional location determining circuitry calculates the extent of ***proximity of the user’s finger to the interactive surface element*** 1208. FIG. 18A shows the finger separated by a distance H from the surface of the interactive surface element 1208, in a hover state. Three-dimensional location determining circuitry is operative to distinguish between a finger touching the surface of interactive surface element 1208, a finger hovering thereover, as shown in FIG. 18A, and a situation wherein there is no detection of a ***finger in propinquity to the interactive surface element.***”) (emphasis added); FIG. 18A. As noted previously, the specification is careful to distinguish between an object such as a finger touching and not touching (e.g., hovering). A POSITA would understand from this passage that a finger hovering over and not touching the surface of interactive surface element is in propinquity or proximity to the interactive surface element.

44. The claim language uses “propinquity” consistent with this plain meaning. The claims recite “when the [at least one] object has at least a predetermined degree of propinquity to” and “configured to illuminate at least one object having at least a predetermined degree of propinquity to” – which signifies that “propinquity” is used to describe a spatial relationship between the object and the device or screen. A POSITA would understand that “propinquity,” as used in the claims and specifications, means an object’s proximity or nearness to the device or screen.

45. In his Declaration, Dr. Sarrafzadeh ignores both the intrinsic evidence and extrinsic dictionary evidence supporting the synonymous nature of “propinquity” and “proximity” and attempts to redefine both of these terms to read in additional claim limitations. I note that Dr. Sarrafzadeh’s *ad hoc* definition of “proximity” somehow excluding touch is unsupported by any intrinsic or extrinsic evidence.

46. Samsung’s proposed construction rewrites “a predetermined degree of propinquity” to “within a predetermined proximity to **and** when the object is touching” such that the claimed position sensing of an object is limited to only instances where the object is both within a predetermined proximity to **and** touching the device. In doing so, the construction significantly departs from the plain meaning of the disputed term in a manner that is wholly unsupported by the intrinsic evidence.

47. Nothing in the specification or prosecution history defines “propinquity” in a way different from its ordinary meaning. More importantly, nothing in the specification limits position sensing of an object to only instances when the object is in proximity to and touching the device. The relevant independent claims do not recite the word “touch” or “touching.” The relevant independent claims do not limit position sensing to only instances where the object is “touching”

the device. A POSITA would therefore not understand “propinquity” to necessarily require “touching.” There is no lexicography that compels such extreme narrowing from the plain meaning. And Samsung has not pointed to any clear disclaimer of the invention from the prior art to warrant the narrowing it seeks.

48. In sum, Samsung’s constructions are incorrect because they are not the plain meaning and because there is no lexicography or disclaimer that requires them. For example, the specification and prosecution history do not redefine “propinquity” to mean Samsung’s constructions. Nor do they require position sensing to occur only when an object is in proximity to, and touching, the device. I have reviewed the intrinsic evidence and found no lexicography or disclaimer that supports Samsung’s constructions.

49. A POSITA would understand every word of the “propinquity” terms and would further understand that no further construction is required. The “propinquity” terms consist of ordinary words used in their ordinary senses that have a clear meaning to a POSITA. I address “propinquity” above. The remaining terms have a plain and ordinary meaning and the specification uses these terms in accordance with their plain and ordinary meaning.

C. “pixel array”

Claim Term	Power2B’s Construction	Samsung’s Construction
“pixel array” (’675 Patent, claims 1, 13; '850 Patent, claims 15, 21, 26, 30, 31; '093 Patent, claims 1, 12, 44; '931 Patent, claims 1, 13, 21)	“arrangement of semiconductor components”	“arrangement of two or more picture elements”

50. Power2B’s proposed construction is correct and supported by the intrinsic evidence. Samsung’s construction is incorrect in that it attempts to construe “pixel” using only

extrinsic evidence, *i.e.*, dictionaries, and not the phrase “pixel array” as defined clearly in the patent specifications.

51. The specifications of the Asserted Patents explicitly state that the “pixel array” can have input or sensing capabilities. For example, the specifications of the ’675 Patent, ’850 Patent, ’093 Patent and the ’931 Patent each contemplate that the “pixel array” includes sensing capabilities that are used to sense a position of an object. *See e.g.*, ’675 Patent at 4:55-58 (“[A]t least one pixel array including a plurality of detector elements detecting electromagnetic radiation at a baseline level, the at least one pixel array being operative to sense a position of an object with respect to the surface”); 4:62-64 (“[T]he at least one pixel array being operative to sense at least a position of at least one object with respect to the at least one pixel array”); 5:14-18 (“Preferably, the at least one pixel array senses light reflected from the at least one object. Additionally, the at least one pixel array senses ambient light reflected from the at least one object. Alternatively or additionally, the at least one pixel array senses IR light reflected from the at least one object.”); ’850 Patent at 4:46-50; 4:53-56; 5:10-14; ’093 Patent at 4:55-59; 4:63-65; 5:20-25; 6:12-18; and ’931 Patent at 1:41-52 (“[A] second pixel array operative to sense at least a position of an object with respect to the first pixel array . . . the second pixel array includes a plurality of detector elements”); 4:20-23; 4:53-55.

52. In addition, the claims of the ’675 Patent, ’850 Patent and the ’093 Patent similar recite that the “pixel array” senses a position of an object. *See e.g.*, ’675 Patent at Claim 1 (“at least one pixel array comprising a plurality of detector elements configured to detect electromagnetic radiation at a baseline level . . . the at least one pixel array being configured to sense at least a position of the at least one object with respect to the at least one pixel array”); claim 2 (“wherein the at least one pixel array is configured to sense light reflected from the at least

one object.”); ’850 Patent at claim 31 (“at least one pixel array including a plurality of detector elements configured to detect electromagnetic radiation at a baseline level . . . the at least one pixel array being configured to sense at least a position of at least one object with respect to the at least one pixel array”); claim 32 (“wherein the at least one pixel array is configured to sense light reflected from the at least one object.”); claim 39; ’093 Patent at claim 63 (“at least one pixel array including a plurality of detector elements detecting electromagnetic radiation at a baseline level . . . said at least one pixel array being operative to sense at least a position of at least one object with respect to said at least one pixel array”); claim 68 (“wherein said at least one pixel array senses light reflected from said at least one object.”); claim 69 (“wherein said at least one pixel array senses ambient light reflected from said at least one object.”); claim 70 (“wherein said at least one pixel array senses IR light reflected from said at least one object.”).

53. The specifications of the Asserted Patents also explicitly state that a “pixel array” can have output capabilities. For example, the specifications of the ’850 Patent, ’093 Patent, and the ’931 Patent each describe a “pixel array operative to provide a visually sensible output” which includes output capabilities that are used to provide a visually sensible output. *See e.g.*, ’850 Patent at 1:56-57 (“There is thus provided in accordance with a preferred embodiment of the present invention an integrated display and input device including a pixel array operative to provide a visually sensible output”; 9:53-55 (“These devices preferably include a pixel array operative to provide a visually sensible output”).

54. The specification of the ’931 Patent makes both input and output contexts for “pixel array” explicit. *See e.g.*, ’931 Patent at 1:56-60 (“The present disclosure seeks describes an integrated display and input device. In accordance with one preferred embodiment of the present disclosure an integrated display and input device including a first pixel array operative to provide

a visually sensible output, a second pixel array operative to sense at least a position of an object . . .”). A POSITA would understand that, depending on the context, a “pixel array” can refer to an input device with sensing capabilities or an output device.

55. The asserted claims all use the term “pixel array” in an unambiguous context such that a POSITA would easily understand whether the recited pixel array is an input device with sensing capabilities or an output device. I will provide the full context for “pixel array” in each relevant claim element for each of the Asserted Patents below.

56. Claims 1 and 13 of the ’675 Patent both recite “at least one pixel array comprising a plurality of detector elements configured to detect electromagnetic radiation” A POSITA would understand this refers to a pixel array with input or sensing capabilities.

57. Claim 15 of the ’850 Patent recites “a pixel array configured to provide a visually sensible output. . . .” A POSITA would understand this refers to a pixel array with output functionality. Dependent claims 21, 26 and 30 of the ’850 Patent inherit this context. Claim 31 of the ’850 Patent recites “at least one pixel array including a plurality of detector elements configured to detect electromagnetic radiation. . . .” A POSITA would understand this refers to a pixel array with input or sensing capabilities.

58. Claims 1 and 44 of the ’093 Patent both recite “a pixel array configured to provide a visually sensible output. . . .” A POSITA would understand this refers to a pixel array with output functionality. Dependent claim 12 of the ’093 Patent inherits this context.

59. Claims 1 and 21 of the ’931 Patent recite “a display panel having a pixel array that defines a display area, the pixel array is configured to visually present digital content” Claim 13 of the ’931 Patent recites “displaying digital content by a pixel array that defines a display area on a portion of a display panel” A POSITA would understand from the context of “pixel

array” in the asserted claims of the ’931 Patent that these claim elements refer to pixel arrays with output functionality.

60. A POSITA would therefore not limit “pixel” to “picture elements,” as Samsung and Dr. Sarrafzadeh suggests, because doing so entirely ignores the context in which the phrase “pixel array” is used and also ignores all of the intrinsic evidence.

61. In my opinion, Power2B’s construction is the only one that accommodates the different contexts in which “pixel array” is used and accurately reflects the intrinsic evidence. The overwhelming intrinsic evidence demonstrates that “pixel array” is not limited to solely output display-related functionality, but rather also includes input sensing capabilities. A POSITA would understand whether a recited “pixel array” is used for input or output from the context in which the phrase appears. For the input sensing context, the specifications disclose that the pixel array “may be formed of one or more CCD or CMOS arrays, or may be created by photolithography.” *See e.g.*, ’675 Patent at 12:32-50; 16:50-59; 18:1-22; 52:21-37. For the output display context, the specifications also disclose that the display elements may “includ[e] LCD or OLED elements. *See e.g.*, ’675 Patent at 12:32-50; 16:60-17:4; 18:1-22; 52:21-37.

62. A POSITA would also understand that a “charge-coupled device” is commonly abbreviated as CCD, and that CMOS arrays, LCD, and OLED elements, as recited in the specifications of the Asserted Patents, are all semiconductor components. Indeed, dictionary definitions confirm that CCD and LED devices are semiconductor components. For example, the Merriam-Webster Dictionary (2004) provides that “charge-coupled device” means “a semiconductor device used esp. as an optical sensor” and that “LED” means “a semiconductor diode that emits light when a voltage is applied to it and is used esp. for electronic displays.” Ex. 12 at P2BGES-0007821-7822. As such, a POSITA reviewing the intrinsic evidence would

understand that “pixel array,” as used in the specification and the claims, means components that provide display and/or sensing functionality, and such components are semiconductors. Power2B’s proposed construction of an “arrangement of semiconductor components” is therefore the correct construction.

63. Dr. Sarrafzadeh opines that Power2B’s construction is wrong because it is so broad that it would cover any arrangement of any possible “semiconductor components.” I disagree. Where the claims recite “pixel array,” they recite additional limitations associated with the “pixel array” such that the term sufficiently describes the types of “semiconductor components” necessary to satisfy the claim. For example, claim 1 of the ’675 Patent recites, in part: “at least one pixel array comprising a plurality of detector elements configured to detect electromagnetic radiation at a baseline level.” The “pixel array” must therefore include “a plurality of detector elements” that are “configured to detect electromagnetic radiation at a baseline level.” Claim 1 does not recite merely a “pixel array” without any further limitations. As another example, claim 15 of the ’850 Patent recites, in part: “a pixel array configured to provide a visually sensible output.” Here, the “pixel array” must include semiconductor components for “provid[ing] a visually sensible output.” Similarly, claim 1 of the ’093 Patent recites, in part: “a pixel array operative to provide a visually sensible output.” Again, the “pixel array” must include semiconductor components that are “operative to provide a visually sensible output.” And claim 1 of the ’931 Patent recites, in part: “a display panel having a pixel array that defines a display area, the pixel array is configured to visually present digital content.” Again, the “pixel array” must include semiconductor components that are “configured to visually present digital content.” As such, contrary to Dr. Sarrafzadeh’s opinion that “pixel array” can be any kind of semiconductor component, a review of the surrounding claim language reveals that the term “pixel array” is not

used in isolation, but rather used in conjunction with the surrounding claim language to describe the input/output functionality and the types of semiconductor components that may satisfy the claims. Dr. Sarrafzadeh also contends that under Power2B's construction, Random Access Memory (RAM) could be a "pixel array." Dr. Sarrafzadeh fails to give the surrounding claim language any weight in making such an assertion. A POSITA would understand that computer memory can't be configured to detect electromagnetic radiation at a baseline level or configured to visually present digital content. Nowhere do the claims recite a "pixel array" that has functionality consistent with computer memory. As such, Dr. Sarrafzadeh's argument makes no sense.

64. I have also reviewed the extrinsic evidence cited by Samsung. While Dr. Sarrafzadeh provided several dictionary definitions for "pixel" in his Declaration (*see* Sarrafzadeh Decl. at ¶ 69), he has been careful to only handpick definitions corresponding to output/display functionality. Dr. Sarrafzadeh's approach ignores the reality that the term "pixel" has a long history of also being used in the context of input/sensing functionality. One common example is the "megapixel" specification for a digital camera which describes the number of pixels in the camera's sensor. Dictionary definitions provide these multiple meanings for "pixel" and are consistent with the intrinsic evidence. For example, the Merriam-Webster Dictionary (2004) provides two definitions for "pixel": "1: any of the small elements that together make up an image (as on a television) 2: any of the detecting elements of a charge-coupled device used as an optical sensor." Ex. B at 4. Samsung is attempting to improperly construe the term "pixel array" by only considering the first definition. A POSITA would understand both definitions are relevant to the inventions in the Asserted Patents and would be able to easily infer the appropriate definition from the input/output context in which "pixel array" is used in the claims and specification. The

definitions provided by Dr. Sarrafzadeh therefore do not capture the full scope of the definitions of “pixel” and have been handpicked to exclude the common usage of “pixel” in the context of providing sensing functionality, *e.g.*, a CCD optical sensor with one or more pixels.

D. “The at least one pixel array being configured to sense a position of at least one object with respect to a surface thereof”

Claim Term	Power2B’s Construction	Samsung’s Construction
“The at least one pixel array being configured to sense a position of at least one object with respect to a surface thereof” (’675 Patent, claims 1, 13)	Not indefinite “the at least one <i>pixel array</i> being configured to sense a position of an object with respect to a surface of the <i>pixel array</i> ,” where <i>pixel array</i> means “arrangement of semiconductor components”	Indefinite

65. Samsung contends that this claim term is indefinite because it is unclear what “a surface thereof” is referencing. I disagree. Power2B proposes to construe this term as “the at least one pixel array being configured to sense a position of an object with respect to a surface of the pixel array.” In considering the surrounding claim language of claim 1, this claim term would be well understood by those skilled in the art. The claim term refers to “position sensing” of an object with respect to a surface. Further down in the same claim limitation, this same “position sensing” of the object is referenced again, but this time with explicit reference to the “pixel array.” As such, one skilled in the art, reading this claim term in context of the surrounding claim language, would understand that “a surface thereof” is referencing position sensing of the object with respect to a surface of the pixel array.

1. A position sensing assembly comprising:
 an interactive surface element defining a surface;
 at least one pixel array comprising a plurality of detector elements configured to detect electromagnetic radiation at a baseline level, the at least one pixel array being configured to sense a position of at least one object **with respect to a surface thereof** according to locations of ones of the plurality of detector elements at which at least one of an amount of radiation detected and a change in the amount of radiation detected exceeds a predetermined threshold, the at least one pixel array being configured to sense at least a position of the at least one object **with respect to the at least one pixel array** when the at least one object has at least a predetermined degree of propinquity to the at least one pixel array;

66. Samsung contends that “a surface thereof” could refer to the object, e.g., the finger or pointing device, itself. Nowhere in the specification, however, is position sensing of an object with respect to the surface of an object described. As such, a POSITA would not understand “a surface thereof” as referencing a surface of the object itself. Instead, a review of the specification would reveal that the specification describes position sensing of an object consistently with respect to some component of the position sensing assembly. *See e.g.*, ’675 Patent at 3:38-41 (“Preferably, at least one detector in the arrangement detects electromagnetic radiation at a baseline level and senses the position of the object with respect to the interactive surface element”); 4:62-64 (“[T]he at least one pixel array being operative to sense at least a position of at least one object with respect to the at least one pixel array”).

67. Samsung also contends that “a surface thereof” could refer to a surface of the “interactive surface element.” Consideration of the surrounding claim language, however, warrants a different result. The claim already recites a surface of the “interactive surface element,” therefore when “a surface thereof” is later recited, a POSITA would understand that “a surface

thereof” must refer to a different surface than the surface previously recited because “a surface thereof” is introduced with “a” and not referenced using the word “the.”

1. A position sensing assembly comprising:
 an **interactive surface element** defining a **surface**;
 at least one pixel array comprising a plurality of detector elements configured to detect electromagnetic radiation at a baseline level, the at least one **pixel array** being configured to sense a position of at least one object with respect to **a surface thereof** according to locations of ones of the plurality of detector elements at which at

68. A POSITA would therefore understand that when viewed in light of the surrounding claim language and specification, the claim term is not susceptible to multiple meanings and would inform, with reasonable certainty, those skilled in the art about the scope of the invention.

69. Dr. Sarrafzadeh argues that this term is indefinite because there are at least three possibilities to which “a surface thereof” could be referencing. I disagree with Dr. Sarrafzadeh for the reasons described above. I will further note that Dr. Sarrafzadeh fails to describe how each of the alleged possibilities would prevent a POSITA from understanding the scope of the entire claim. Regardless of whether the “surface thereof” references the interactive surface element or the pixel array, the claim nonetheless recites position sensing of an object with respect to a surface of the position sensing assembly and Dr. Sarrafzadeh fails to articulate how the claim, as a whole, would fail to inform a POSITA of the scope of the claim because it is allegedly unclear what surface “a surface thereof” is referencing. In other words, Dr. Sarrafzadeh fails to explain how each of his competing possibilities changes the scope of the claim in a manner that would make it indefinite.

70. To the extent the Court finds that “a surface thereof” refers to the surface of the interactive surface element or a surface of the pixel array, a POSITA would understand that the position of an object sensed with respect to one surface could easily be translated to the position

of the object with respect to any other surface. In all of the example embodiments, the interactive surface element and the pixel array are in a rigid and fixed positional relationship in the position sensing assembly. Irrespective of which surface is used as the reference for the sensed position, simple geometric calculations could easily be employed by a POSITA to transform the position of an object with respect to one surface, to a position of the object with respect to any other surface of the position sensing assembly.

E. “circuitry coupled to and receiving an output from the at least one pixel array receiving”

Claim Term	Power2B’s Construction	Samsung’s Construction
“circuitry coupled to and receiving an output from the at least one pixel array receiving” (’675 Patent, claims 1, 13)	Not indefinite “circuitry coupled to and receiving an output from the at least one pixel array,” where the term <i>pixel array</i> means “arrangement of semiconductor components”	Indefinite

71. A POSITA would understand that the claim term includes an errant “receiving” that is an obvious typographical error. A plain reading of the claim limitation demonstrates that there is a typographical error and correcting this typographical error by removing the second “receiving” makes the claim limitation easy to understand and is not subject to reasonable debate based upon a consideration of the entire claim and the specification. Specifically, in the Summary of the Invention, the specification includes language parroting claims 1 and 13 that omits the typographical error:

There is also provided in accordance with another preferred embodiment of the present invention a position sensing assembly including an interactive surface element defining a surface, at least one pixel array including a plurality of detector elements detecting electromagnetic radiation at a baseline level, the at least one pixel array being operative to sense a position of an object with respect to the surface according to locations of ones of the plurality of detector elements at which at least one of the amount of radiation detected and the change in the amount of

radiation detected exceed a predetermined threshold, the at least one pixel array being operative to sense at least a position of at least one object with respect to the at least one pixel array when the at least one object has at least a predetermined degree of propinquity to the at least one pixel array and ***circuitry receiving an output from the at least one pixel array*** and providing a non-imagewise input representing the position of the at least one object relative to the at least one pixel array to utilization circuitry.

'675 Patent at 4:52-5:2 (emphasis added). As such, it is my opinion that correction of the errant second "receiving" is not subject to reasonable debate based on consideration of the claim language and the specification.

72. In reviewing the prosecution history, there was nothing to suggest a different interpretation of the claims, as there were no arguments made relying on the typographical error to overcome prior art and there was no mention of the typographical error as a reason for allowing the application.

73. Dr. Sarrafzadeh states that this term is indefinite because the second "receiving" in the term makes the entire claim nonsensical. Dr. Sarrafzadeh admits that the claim makes no sense with the errant "receiving," but instead of simply admitting that it's an obvious typographical error and interpreting the term without the typographical error, attempts to assign some meaning to the errant word. In doing so, Dr. Sarrafzadeh confirms that correction is the proper course, as Dr. Sarrafzadeh admits that nowhere in the specification is the pixel array described as "receiving" nor disclosed as the name of a physical component. These are the very reasons why a POSITA would indeed acknowledge the errant second "receiving" as a typographical error and delete the second "receiving" in understanding the meaning of the term.

74. A POSITA would therefore understand that the claim term has an obvious typographical error that when corrected, would inform, with reasonable certainty, those skilled in the art about the scope of the invention. Specifically, a POSITA would understand this claim term

on its face, and in light of the intrinsic evidence, to require circuitry to process the signals received from the pixel array.

F. The “impingement” terms

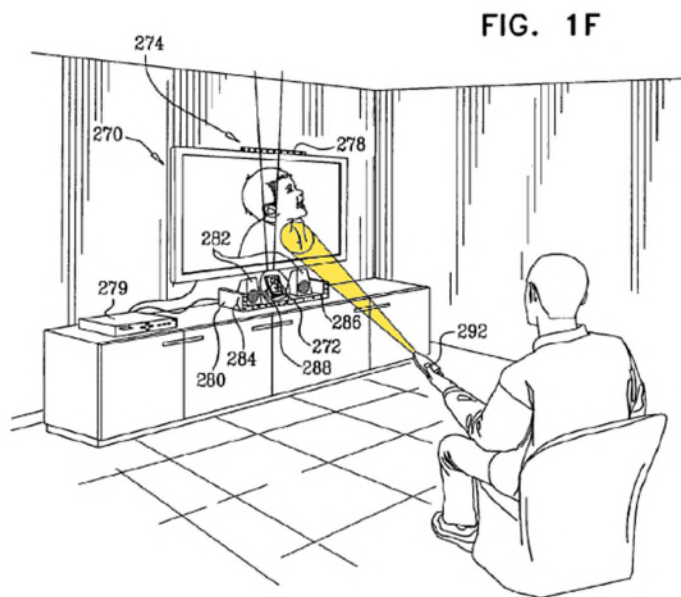
Claim Term	Power2B’s Construction	Samsung’s Construction
“each of the at least one input sensor being configured to provide an output indicative of an impingement of an electromagnetic radiation spot on at least one of the at least one first region and the at least one second region of the at least one interactive surface element” (’170 Patent, claim 1)	<i>impingement of an electromagnetic radiation spot</i> means “an area of reflected or projected radiation,” and plain and ordinary meaning for the remaining language	“each of the at least one input sensor being configured to provide an output distinguishing impingement of an object on electromagnetic radiation at a spot on either the at least one first region or the at least one second region of the at least one interactive surface element”
“impingement of an electromagnetic radiation spot” (’170 Patent, claim 1)	“an area of reflected or projected radiation”	This term must be understood in the context of the larger phrase above. See proposed construction above.

75. Samsung’s construction completely changes the asserted claims by requiring “impingement of an object” whereas the original claim recites “impingement of an electromagnetic radiation spot.” Samsung’s construction limits this claim term by requiring an object to impinge on electromagnetic radiation. The plain language of the claim, however, makes it clear that “impingement” involves the electromagnetic radiation and the “interactive surface element.” The “object” is not recited in this claim element and hence can’t impinge on anything. I therefore disagree with Samsung’s proposed construction because it is contrary to the claim language itself, and unnecessarily reads out embodiments disclosed in the ’170 Patent.

76. The ’170 Patent discloses various embodiments for sensing a position of an object (e.g., finger, stylus, or remote control) using “impingement of an electromagnetic radiation spot” on a surface (e.g., screen). Certain embodiments disclose use of an electromagnetic radiation

emitting object, such as a stylus or remote. *See e.g.*, '170 Patent at FIGS. 1C, 1F, 2B & 3B; *see also* '170 Patent at 14:21-28 (“A user, holding a light beam emitting remote control device 292, may interact with one or more of the large screen display 270, mobile device 272, interactive interface assembly 274 and the docking cradle 288 by directing a beam of light in a direction which causes impingement of a spot of light on any one or more of large screen display 270, mobile device 272 and linear arrays 278, 284 and 290 of interactive interface assembly 274.”). In these examples, the “object” itself is incapable of “impinging on electromagnetic radiation” – as Samsung proposes – because the object is the emitter of the electromagnetic radiation.

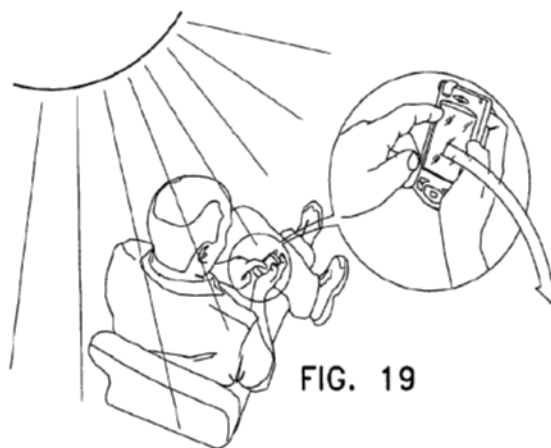
Annotated Excerpt of FIG. 1F of the '170 Patent



77. Other embodiments disclose use of electromagnetic radiation reflected by an object, such as a finger. *See e.g.*, '170 Patent at 15:3-6 (“Light, preferably including light in the IR band, reflected by the user’s finger, propagates through at least one cover layer 308 and is detected by one or more of detector elements 302.”). In some instances, the source of reflected light may be external to the device as shown in FIG. 19. *See e.g.*, '170 Patent at 15:20-21. In such

cases, it is unclear how “impingement of an object on electromagnetic radiation” would occur, as the electromagnetic radiation could be ambient light, for example. The specification of the ’170 Patent supports this possibility, disclosing “the at least one pixel array senses ambient light reflected from the at least one object.” ’170 Patent at 5:16-18. Requiring the impingement of an object on ambient light would make no sense to a POSITA. The correct construction should retain the original claim phrase “impingement of an electromagnetic radiation spot.”

Excerpt of FIG. 19 of the ’170 Patent



78. In addition, the intrinsic evidence demonstrates that “impingement of an electromagnetic radiation spot” – as used in claim 1 – refers to an interaction between electromagnetic radiation and a surface (e.g., screen), not an interaction between an object and electromagnetic radiation – as Samsung proposes. For example, the specification of the ’170 Patent explains:

The array detection output is constructed on the basis of outputs of the individual detector in the array, taking into account the relative positions of the individual detectors. One or more array detection outputs represent the shape, size, location and/or intensity of *a light spot defined by the impingement of light on the interactive surface or a layer thereof.*

’170 Patent at 69:33-39 (emphasis added).

79. The specification also uses “impingement” to describe an interaction point or area with a surface (e.g., screen, button, slider, etc.). *See e.g.*, ’170 Patent at 51:66-3 (“In the configuration shown in FIG. 18B, two-dimensional location determining circuitry (not shown) preferably calculates the two-dimensional position of the impingement point of the user’s finger on or above interactive surface element 1228”); 57:26-30 (“These characteristics of the various components of the interactive assembly are employed by the two-dimensional location determining circuitry to calculate the two-dimensional position of the impingement point of the user’s finger on the interactive surface element 1308 or above it.”); 64:48-54 (“FIG. 23B shows finger 1606 located at a first distance D1 from the second region of the interactive surface element 1601 overlying keyboard 1604, such that the propinquity responsive input functionality senses finger 1606 in propinquity to keyboard 1604 and defines an impingement area 1609 that is generally centered on a first button 1611, even though it may also partially impinge on other buttons.”); 67:65-68:5 (“FIG. 25B shows finger 1806 located at a second location in the second region of the interactive surface element 1802 overlying slider 1805, such that the propinquity responsive input functionality senses the location of finger 1806 in propinquity to slider 1805 and defines an impingement area 1810 that is generally centered on a location of the slider 1805, even though it may also partially impinge on other portions of the slider 1805.”).

80. In addition, claim 1 does not recite “impingement” in connection with the object and electromagnetic radiation. Rather, claim 1 recites “impingement” in connection with “an electromagnetic radiation spot” and regions of the “interactive surface element.” Dependent claim 28 (which ultimately depends on claim 1) also reinforces the notion that “impingement” is intended to refer to an interaction with the “interactive surface element”:

28. An interactive assembly according to claim 27, wherein the array detection output includes information corresponding to a location of an

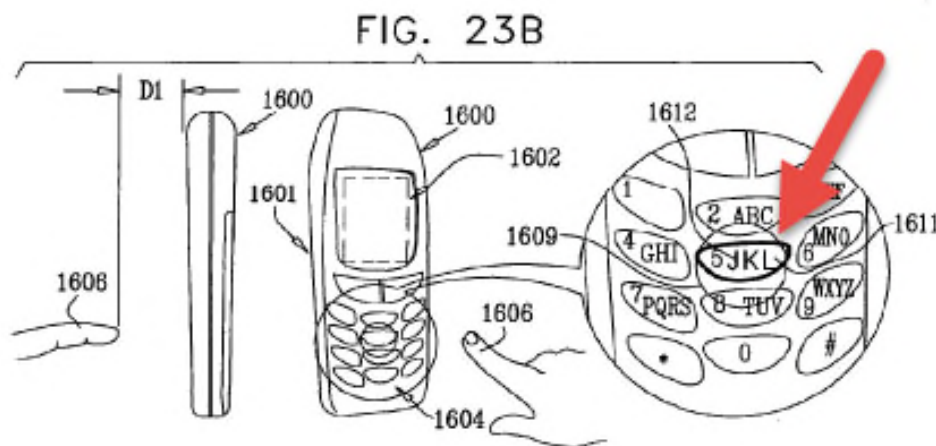
impingement point of the object *on the interactive surface element* coinciding with a viewing plane.

81. Samsung’s proposed construction fundamentally changes the plain meaning of the claim and also creates ambiguity. It would be unclear to a POSITA what “distinguishing impingement” means as the claims and the specification do not use this term. The specification of the ’170 Patent discloses distinguishing positions, distinguishing directions of motion, distinguishing between touching or hovering over a surface, distinguishing between degrees of propinquity, and distinguishing between reflective symmetries. *See e.g.*, ’170 Patent at 9:55-10:9; 50:9-35; 65:19-23; 71:25-48. There is no disclosure of what “distinguishing impingement” might mean. It would also be unclear to a POSITA how an object can impinge “on electromagnetic radiation.” At best, this could be interpreted to correspond to a specific narrow embodiment where the interactive surface element includes an emitter of electromagnetic radiation and a finger placed in propinquity to the surface impinges on the radiation from this emitter. But, for reasons discussed above, this construction improperly limits the claim terms by reading out other relevant preferred embodiments.

82. Power2B’s proposed construction, on the other hand, accords with the plain and ordinary meaning of the term as described in the specification. The ’170 Patent discloses that the object (*e.g.*, a stylus or remote) may emit electromagnetic radiation, hence Power2B’s inclusion of “projected” into its proposed construction. *See e.g.*, ’170 Patent at 14:21-28; FIGS. 1C, 1F, 2B & 3B. Alternatively, the object may reflect electromagnetic radiation, hence Power2B’s inclusion of “reflected” into its proposed construction. *See e.g.*, ’170 Patent at 15:3-6 (“Light, preferably including light in the IR band, reflected by the user’s finger, propagates through at least one cover layer 308 and is detected by one or more of detector elements 302.”). As I describe above, in describing “impingement” of radiation onto a surface, button, or other component, the ’170 Patent

described the resulting “spot” as an “area.” *See e.g.*, ’170 Patent at 64:48-54 (“FIG. 23B shows finger 1606 located at a first distance D1 from the second region of the interactive surface element 1601 overlying keyboard 1604, such that the propinquity responsive input functionality senses finger 1606 in propinquity to keyboard 1604 and defines an *impingement area* 1609 that is generally centered on a first button 1611, even though it may also partially impinge on other buttons.”); 67:65-68:5.

Annotated FIG. 23B of the ’170 Patent



83. It is therefore my opinion that Power2B’s construction is supported by the intrinsic evidence and provides clarity to the meaning of “impingement of an electromagnetic radiation spot.” The remainder of the “impingement” terms consist of words that have a clear meaning to a POSITA. The remaining words have a plain and ordinary meaning and the specification uses these words in accordance with their plain and ordinary meaning.

VIII. CONCLUSION

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct and that this Declaration was executed on the 8th day of September, 2021, at Shrewsbury, Massachusetts.

By:

A handwritten signature in black ink, appearing to read "D. Richard Brown III", written over a horizontal line.

D. Richard Brown III